COMPARISON BETWEEN THE BEES ALGORITHM AND GENETIC ALGORITHM MODEL IN MANPOWER ALLOCATION ON CELL LOADING PROBLEM

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ABSTRACT

A number of resolutions to the cell loading problem have been stated in the literature. However, Manpower Allocation and Cell Loading (MACL) problem is comparatively new. Therefore, this thesis concentration on such topics. This research not only analyzes the MACL problem with a mathematical model and genetic algorithm (GA) and the Bees Algorithm but also it make a comparison among the mathematical models to measure the efficiency of the stated algorithm in solving the number of tardy jobs concept and also adds original aspects, the Cell Formation, the traditional GA methods. The objective of this thesis is to compare between GA and the Bees Algorithm on the MACL problem by both mathematical models and then compare the results in some cases. Results show that there are different factors of GA that it is not exist in the Bees Algorithm. Both of the proposed algorithm finds optimal or near optimal solutions for the MACL especially in large problems.

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DEDICATION

To my parents Sayel and Sohad, and to my brothers, and sisters.

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LIST OF ABBREVIATIONS

CM	Cellular Manufacturing
EC	Evolutionary Computation
MACL	Manpower Allocation and Cell Loading
GA	Genetic Algorithm
BA	Bees Algorithm
CF	Cell Formation
PSO	Practical Swarm Optimization
HRD	Human Resource Development
NP	Nondeterministic polynomial

LIST OF APPENDICES

CHAPTER ONE

INTRODUCTION

In this chapter explains briefly the different manufacturing plans. Then, state along the problem studied with the study objectives. Finally, work done to achieve these objectives is summarized.

1.1 Manufacturing Layouts

Manufacturing Industry is faced with significant challenges due to the rapid development in the global production sector. As a result, these challenges have forced the manufacturing companies to work more efficiency and quality to cope with these challenges. The traditional industry system such as job shop and flow lines cannot handle such challenges (Pham et al., 2008).

The basic plans in manufacturing are process, product, and cellular. Traditional manufacturing plan is focused on an economy scale and machine utilization, it has the idea of idle machine which means if the machine is idle it is losing money, so it have to still working at all costs. It is depends on process plan (functional layout). In process plan, machines that have same functionality are grouped together in departments and parts transfer to diverse departments the main reason of part grouping is to accomplish the operations. This layout places little constraint on the type of product manufactured and therefore it is suitable for most production situations (Süer et al., 1995). Furthermore,

The contents of the thesis is for internal user only

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